

## AMAZING MARVELS OF TOMORROW

# A-POWERED TRAINS IN GLASS TUBES

*They'll give airliner speeds  
plus weather-free reliability.*

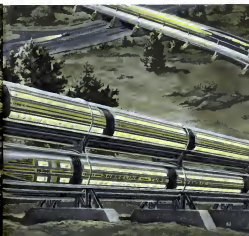
By Frank Timley

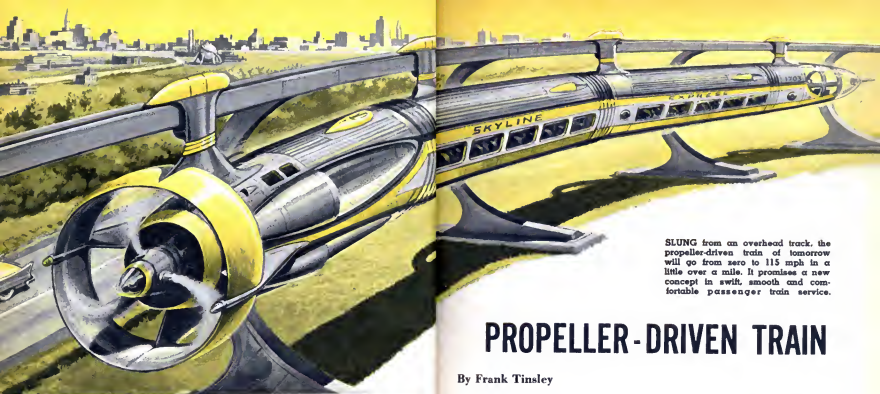
THE train of the future, whipping passengers vast distances through continent-girding tubes at speeds and in comfort far surpassing that of modern air travel, is no longer merely a dream in the minds of our more imaginative

designers and engineers. This old idea (New York's first working subway train was sucked through a tube) has been brought well within the realm of probability—and the hero of this advance is, as has so often been the case in the his-

tory of technology, a new material

A crude form of this material has been serving man since the dawn of history. Glass, commonly thought of as that brittle stuff that boys like to smash with baseballs and slingshots, is in this gen-





SLUNG from an overhead track, the propeller-driven train of tomorrow will go from zero to 115 mph in a little over a mile. It promises a new concept in swift, smooth and comfortable passenger train service.

## PROPELLER-DRIVEN TRAIN

By Frank Tinsley

THE propeller-driven monorail train zooming out of New York's Pennsylvania Station accelerates from zero to 115 mph in a little over one mile. Its destination, Washington, D. C., will be reached in record time.

This revolutionary streamliner may soon become a reality. Curtiss-Wright Corp. has proposed powering high speed passenger trains with air propellers utilizing C-W's Turbo-compound airplane engine. Pennsylvania Railroad is considering this project, a possible solution to the American railroads' quest for economic and lightweight rolling stock.

The MI-designed PDT would be a monorail slung from an overhead track. Its jointed cylindrical body lends itself perfectly to effective streamlining and propeller drive.

The PDT engine at the rear is run by

remote control from the cab at the front of the train. Instrument readings are made via closed-circuit TV. The three-bladed propeller is reversible, serving as a pusher in forward "flight" and as a puller for braking and reverse. Air for engine operation and cooling is sucked in through large scoops and expelled aft through the propeller blades, contained in a ring-like shroud for efficiency and safety.

Station platforms would be enclosed in glass (see illustration) because slipstream blasts would be formidable, even at low speeds. As the train brakes to a halt, the station access doors open outward to form windbreaks, and an extension platform slides out against the car's side.

Passengers would step off clean, relaxed and untired from what may be the train of tomorrow. •

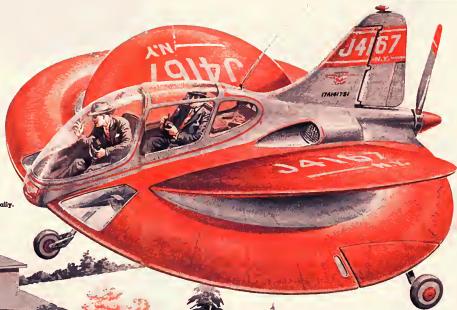


## FLYING SAUCERS FOR EVERYBODY!

*Within ten years you may  
be commuting by plastic saucer,  
flying from your backyard.*

By Frank Tinsley

SAUCER rises vertically. flies conventionally.



IT IS a bright morning in 1965. At precisely eight a. m. Joe Lees emerges from the back door of his lakeside cottage, only 75 miles from his job in the city. In the graveled center of his backyard his jaunty new plastic saucer rests lightly on three tiny balloon tires.

Greeting his neighbor who rides with him, Joe lifts a flush flap in the saucer's rounded nose. He

turns a recessed locking handle and throws back the bubble-like windshield. Spring loaded, like the hoods of today's cars, the enclosure lifts easily. As it does, the interlinked nose cone swings down to form a handy step.

Joe's neighbor steps up over the low instrument pedestal and then across the folded pilot's seat to his perch in the rear. Joe follows, slams the windshield shut and

# Copter Cops

By Frank Tinsley

TODAY'S high-speed turnpikes require ground-bound traffic police to take to the air and graduate to the status of "Copter Cops," mounted in a vehicle that could speed safely above the car-choked roads and provide a bird's eye view of driving conditions and dangers. Such a vehicle could go far beyond the utility of the present patrol car. It could control traffic speed, clear jams at bottle- [Continued on page 150]



# MI's Wonderful Car-Boat

*Turbine-powered cruiser of the future  
travels on either highway or waterway.*

SOME DAY in the near future a long, sleek car with a bubble canopy will drive down to the water's edge and then splash right in. Once afloat, its wheels will retract and the driver, shifting from gears to a jet thrust, will become coxswain of a speedy family cruiser.

This strange new vehicle will be the car-boat. Propelled by a gasoline turbine engine it will skim over highways at better than 90 mph and reach a top pace afloat of nearly 50 mph. The cabin will serve up air-conditioned comfort for its passengers and offer the riding ease of today's luxury cars.

[Continued on page 166]





demonstration of how fast the new supersonic interceptors can fly. Warden had taken off from Palmdale and reached San Diego in the same time Myrann needed for a cockpit check and a normal take-off.

The deltas are a new family of aircraft. They get their name from the fourth letter of the Greek alphabet, an equilateral triangle, that the new shape somewhat resembles. The delta has been called the wing of the future for aircraft that fly faster than sound. It isn't very efficient at slow speeds, but it goes through Mach 1 with hardly a tremor—then it's hard to catch. Many designers believe that its margin of superiority widens rapidly as the speed goes up. It is said to be more stable and maneuverable than other designs at high altitudes.

"The delta wing gives an interceptor pilot a tremendous advantage at altitudes of around 50,000 feet," says Warden, chief test pilot at Convair's Palmdale, Calif., facility. "A delta can overtake any bomber that has been built so far. If the bomber pilot tries a tight turn in the thin air he loses speed and goes into a stall. He needs maybe 25 miles of space to turn around. The delta can turn much more sharply. If the bomber pilot tries to dive away, his speed goes up and he gets into compressibility. He loses control. Escape is almost impossible."

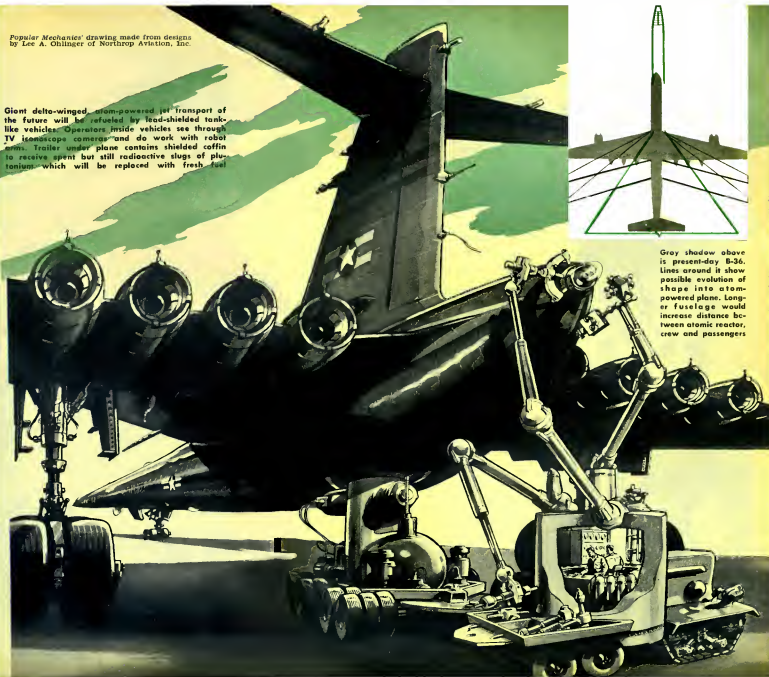
These days the F-102A doesn't even need to get close to its target to make a kill. The big six-foot Falcon homing missiles that it carries can be fired from miles away. Interception is automatic and is performed by the new Hughes "seek-find-kill" electronic system that guides the interceptor to the target. If air-to-air aimed rockets are to be fired instead of the guided missiles, the electrical brain "locks on" the target and gives steering directions to the pilot so that he flies a lead collision course. Then the system opens the missile doors under the fuselage and launches the armament at the exact instant when a kill is assured.

The delta configuration has so many advantages that England, Sweden, France and Russia, among others, are building delta aircraft. In the United States, Douglas is using a deltalike shape for its F4D Skyhawk and again for its A4D Skyhawk. Ryan Aeronautical selected the delta wing for its new X-13 Vertijet aircraft that takes off straight up. Other deltas are on the way.

The real exponent of the aircraft that is shaped like an arrowhead, however, is Convair, builder of the F-102A. Convair used the wing for its Sea Dart seaplane and also for its XFV-1, the turboprop fighter that takes off and lands on its tail. The Convair designers in San Diego regard it as the logical shape for tomorrow's planes

Popular Mechanics' drawing made from designs by Lee A. Ohlinger of Northrop Aviation, Inc.

Giant delta-winged, atom-powered jet transport of the future will be refueled by lead-shielded tank-like vehicles. Operators inside vehicles see through TV leadscope cameras and do work with robot arms. Trailer under plane contains shielded coffin to receive spent but still radioactive slugs of plutonium which will be replaced with fresh fuel



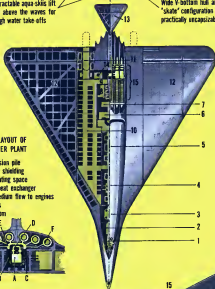
Gray shadow above is present-day B-36. Lines around it show possible evolution of shape into atom-powered plane. Longer fuselage would increase distance between atomic reactor, crew and passengers

# DETAILS OF MI'S

# A-PLANE DESIGN

Retractable aqua-skis lift hull above the waves for rough water take-offs

Wide V-bottom hull and "skate" configuration is practically uncapsizeable



## SCHEMATIC LAYOUT OF ATOMIC POWER PLANT

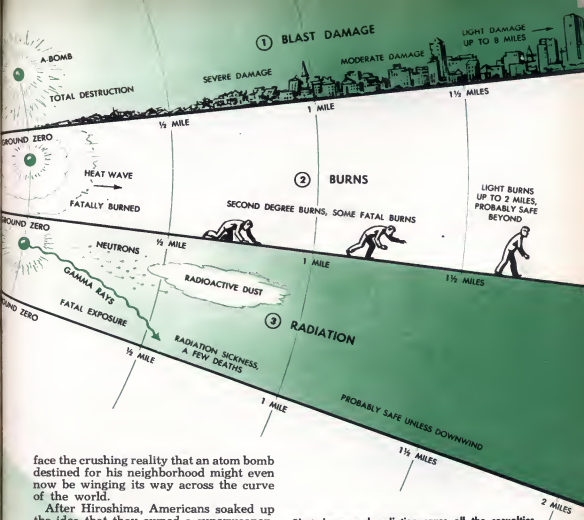
- A. Atomic fission pile
- B. Atomic ray shielding
- C. Heat insulating space
- D. Shielding heat exchanger
- E. Heating medium flow to engines
- F. Jet engines
- G. Control room





The mammoth bomber carries her own "parasite" fighters. The bomb bay will hold three McDonnell XP 68's, 18-foot jet fighters with a top speed of better than 850 mph and a ceiling above 45,000 feet. These tiny planes have no landing gear! After trans-sonic battle they return and latch on to the mother ship with their "sky hooks," as seen in the picture. The wings can fold up for compact storage.





face the crushing reality that an atom bomb destined for his neighborhood might even now be winging its way across the curve of the world.

After Hiroshima, Americans soaked up the idea that they owned a superweapon. "There's no defense." Now, the Manhattan stenographer and the Chicago suburbanite shrug their shoulders in resignation. They are victims of a distorted belief that an entire city can disappear in a whiff of nuclear fission. If a bomb drops, the city dweller figures, there's little he can do to save himself or his family.

There are a great many things he can do.

Hundreds of scientists, under guidance of the Atomic Energy Commission, have been groping into the unknown since 1945, working toward a realistic appraisal of the bomb. With full respect for the awesome power of the weapon, they have found that:

No big city will disappear in the burst of one Hiroshima-type bomb.

There is much less danger from radiation than originally supposed.

Shelters are effective. (In Nagasaki, a few hundred people who were in tunnels almost directly beneath the burst of the A-bomb are alive and healthy today.)

Blast, burns and radiation cause all the casualties in an A-bomb burst. In diagram above, the legends show the effect of each of these three dangers at various distances from ground zero. Whether you live or die depends upon your location and protection



INFLATED RUBBER  
CAMOUFLAGE ROCK

INFLATED RUBBER  
"RADOME"

OFFICERS'  
QUARTERS

360° REVOLVING  
RADAR ANTENNA  
RETRACTS INTO  
BOMBPROOF PIT

INDOOR EXERCISE  
TRACK FOR TROOPS

HELICOPTER  
LANDING AREA  
(CAMOUFLAGE BELOW)

CAMOUFLAGE ROCK  
REMOVED FOR  
LANDINGS

DEFENSE  
LEVEL

AIRLOCK  
STAIRWAY

ENLISTED MEN'S  
LOUNGE, MESS HALL,  
LIBRARY, RADIO, ETC.,  
ON SAME LEVEL

ENGINE ROOM  
DIESEL GENERATORS  
POWER LIGHTING, AIR  
CONDITIONING, ETC.,  
SYSTEMS

BARRACK  
ROOMS

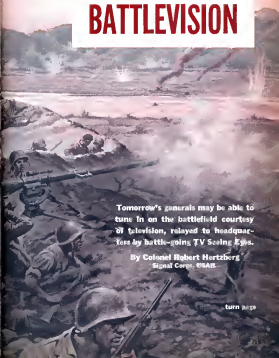
COMMAND CENTER  
OFFICES, COMMUNICATIONS  
ROOMS, ETC. IN LOWEST  
LEVEL

While the battle rages, the Army's Seeing Eye battlefield tank records the action and transmits it back to headquarters where top brass can watch the progress of the fighting and relay the commands.



FRANK TINSLEY 51

## Why Don't We Have... **BATTLEVISION**



Tomorrow's generals may be able to tune in on the battlefield courtesy of television, relayed to headquarters by battle-going TV Seeing Eyes.

By Colonel Robert Hertzberg  
Signal Corps, USAF

turn page

Why Don't We Have...

# BABY ASSAULT TANKS

Tiny but deadly insect-like tri-tracks would spearhead our advancing infantry.

By Frank Tinsley

**W**E are living in a machine age and our wars have become mechanical, but it's still the muddy, tired infantryman who must storm the enemy's stronghold in bloody assault.

In some cases the tactical situation and nature of the terrain make this necessary. In many others, however, the brunt of the attack could just as



Why Don't We Build...

# UNDERWATER TANKS



*We need such a weapon for beachhead invasions . . .  
we have already solved its technical problems.*

*By Frank Tinsley*

**E**VEN at the outset of our World War II campaign of island conquest in the Pacific, it became evident that some form of armor was needed to spearhead landing operations. The old technique of wooden landing barges and surf-spattered Marines was obviously inadequate. To pit unprotected flesh and blood against an array of underwater obstacles, mines and wire entanglements, backed up by well concealed and heavily bunkered machine-gun nests, mortars and artillery, was a murderous waste of expensively trained men.

An attempt to answer the problem was found in the Alligator, an amphibious tractor developed by Donald Roehling for rescue work in the Florida hurricane

*continued on page 76*



FRANK TINSLEY

HANNIBAL crossed the Alps on elephants. Future combat troops may have even greater

## COMBAT VEHICLE

An Original MI Design by FRANK TINSLEY

IMAGINE, if you can, machines that walk—articulated mechanical "insect tanks" that could thread a tortuous path through boulder fields and forests and negotiate mountain passes with heavy loads of freight. Sound crazy? Well, our Armed Forces and Space Authority are dead serious about it. Right now engineers are perfecting pilot models that are already walking around laboratories and testing grounds.

One of these devices is the solar-powered Moon Rover vehicle intended for remote-controlled reconnoitering of the moon. Designed by the engineers of Space-General Corporation, the Moon Rover will be lobbed to our lunar

satellite by an Atlas-Centaur rocket. Upon landing, the six-legged explorer will unfold, raise its panel of sun batteries and, with the power thus generated, march off about its business at a brisk three mph, picking up geological samples with pincer-like fingers, analyzing them and flashing the information back to earth.

The six cam-driven legs of Space-General's moon scout are arranged in pairs—two sets at the rear and one in front—and function so that half of their number are always planted firmly on the ground. A small steering motor turns the vehicle by swinging the front legs in the direction ordered. The joints

maneuverability if our engineers' plans for a mechanical walking train become reality.

## "WALKS" LIKE A MAN

of the Rover's insect-like limbs and all the machine's connecting points are self-lubricating and enclosed in hermetically sealed bellows.

An interim device, the Rover is intended to serve as a rugged forerunner of later, manned vehicles. Our primary interest in Space-General's gadget lies in its use of legs for propulsion, instead of wheels, runners or the like.

An even more ambitious walking machine has been conceived by a Professor of Engineering at the University of Michigan, Joseph E. Shigley. His Army Walker has 16 legs and is designed to walk at ten mph with a man inside it. With the machine still at the experimental level of development, the professor feels that his principal task is to

increase its walking efficiency by recovering and reusing some of the power now lost in leg lifting. To effect this he is studying the power-storing possibilities of the flywheel and the hydraulic accumulator. His present thinking envisions a vehicle supported by expandable legs which are mounted in groups of four at either end of two fore-and-aft axes. At any given moment four of these legs—one in each group—will be planted on the ground; another four will be lifting for a new step; four others will be fully raised; and the final four will be descending.

MI's own version of a mechanical mile train is shown in the accompanying illustrations. Though rather more complicated than current designs, it is,



# Let's Use Helicopter Cavalry

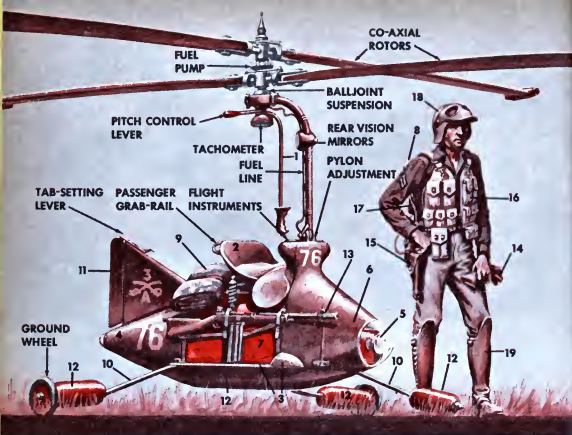


*Scooping in suddenly, helitroopers on powerful "sky horses" could wreak havoc with enemy troops.*

**By Frank Tinsley**

**S**CATTERED along the western slope of the Asiatic coastal range, the copter troopers and their mounts cluster in little groups as the rising sun climbs behind them. The jump-off moment is fast approaching. Within minutes, the sun will burst blindingly above them to cover their westward assault.

The first elements of the blitz landing—submarine-borne marines—had hit the enemy coast only three days ago, seized the controlling crests and passes of the coastal hills in bloody fighting, well covered by massive flights of water-borne jet fighters.



A comparison of equipment carried by the helicopter trooper and the horse cavalryman.

#### HELITROOPER

#### HORSE TROOPER

1. Control stick.
2. Motorcycle/stock saddle combination.
3. Runningboard and toe-caps.
4. Tilting tail cone: ammo, rations, etc.
5. Tilting nose cone: landing lights.
6. Tie-down ropes, tent pins in nose cone.
7. Fuel tank.
8. Slicker on combat pack.
9. Cantle roll: camouflaged copter cover.
10. Three spring landing legs.
11. Directional tail fin and trim tab.
12. Leg floats for water.
13. T-47 auto rifle.
14. Combination sword/tool on belt.
15. Pistol in belt holster.
16. Ammo pockets/armored breastplate.
17. Combat pack on armored backplate.
18. Visored helmet with goggles.
19. Zippered, armored jackboots.

1. Bridle and reins.
2. McClellan saddle.
3. Hooded stirrups.
4. Saddle bags: ammo rations, etc.
5. (No equivalent).
6. Halter shank, lariat, picket pin.
7. Pommel roll (feedbag).
8. Slicker above feedbag.
9. Cantle roll: tent, blankets, etc.
10. Legs.
11. Tail.
12. Horse can swim stream, tow rider.
13. '03 rifle in leather boot.
14. Sabre, right side pommel.
15. Pistol in belt holster.
16. Ammo belt and suspenders.
17. (No equivalent).
18. Campaign hat.
19. High laced boots and spurs.

CONVENTIONAL AIRFOIL  
(THICK SECTION - BLUNT LEADING EDGE)



SUGGESTED SUPersonic AIRFOILS  
(VERY THIN SECTION - SHARP LEADING EDGE)



SLIDING WING SECTIONS RETRACTED  
AND RAM-JET POWER TURNED ON

PAIRING CONE OF RAM  
JET RETRACTED

LANDING ROTORS RETRACTED  
INTO OUTER SKIN OF CABIN

ROTOR HEAD  
PAIRING  
DOORS

TURBO-JET  
EXHAUST NOZZLE

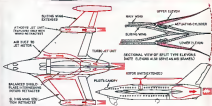
PRESSURIZED  
DOUBLE-DECK CABIN

SUPersonic SECTION AIRFOIL WING

DOUBLE  
GULP

ROTOR UNITS EXTENDED  
FOR SLOW CONTROLLED  
LANDING APPROACH

ATROD JET  
POWER CUT OFF



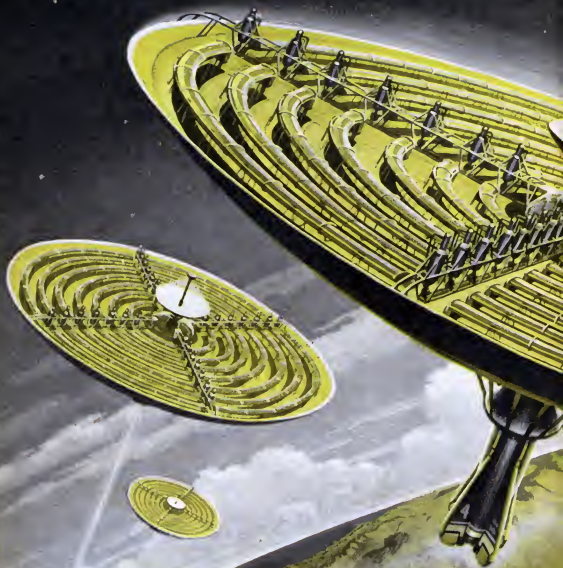
Here is diagrams and drawings that at lower speeds the wing panels are extended, and the helicopter rotor and turbo-jet unit employed.

At supersonic speeds the wing panels are retracted, the rotor is stowed inside the fuselage, and the aircraft is in a conventional configuration.

Douglas Delta, extensively known aircraft shows the probable shape and shape changes of tomorrow's supersonic aircraft as it flies at ordinary speeds (left) and at supersonic speeds (right).

Should earth's food supply  
grow scarce, science will  
look to algal culture and . . .

# Moon Farms



MI artist Frank Tinsley has designed this saucer-shaped space farm. Growing tubes are concentrically arranged on the upper deck; drying and collecting equipment, storage bins, living quarters, etc., are in the shallow bowl beneath. A solar power plant (Sept. '53 MI) is set above the saucer, generates current to operate auxiliary mechanisms. Electric eyes coupled to servo gyroscopes keep both reflector and deck continually facing the sun. Air locks give access to a deck for inspection and maintenance. Each plastic trough is maintained as independent unit. Every day a space cargo ship makes contact with the tubular dock in the satellite's belly to milk it of its produce and transport it to earth.

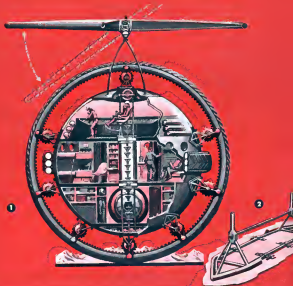
# Junior Scholastic

YOUR WORLD-VIEW MAGAZINE FOR SCHOOL AND HOME • VOLUME 49 • NUMBER 2 • SEPTEMBER 20, 1961

THE UNICYCLE—Will It Carry Men on the Moon? (see Science News, p. 7)

Illustration by Frank Stanley; courtesy of American Bosch Arma Corp.





**MOON EXPLORER diagram:** 1. Sectional cutaway shows triple-deck arrangement, tilting power parasol, spare tire and drive-drum installations on the inner rim of the wheel. 2. Drive-drum mounting is made of welded, lightweight tubing. Simple latch fastenings secure it. All mountings are interchangeable and, disassembled, nest for easy transport.

The Moon Explorer is 32 ft. high. It is driven by electric motors and stabilized and steered by gyroscopic tilting. Power is derived from a circular "parasol" faced with solar batteries that always face the sun. Those atop the disc are of the light-actuated type. The bottom units are thermal generators, extracting electricity from reflected ground heat. This arrangement uses every inch of area and constitutes a

simple, long-lived generator with no moving parts. It not only produces free power but also serves to shield the vehicle's body from the burning rays of the unfiltered lunar sun. Despite its large size, the parasol is extremely light in weight. It consists of an envelope of thin, inflated fabric, stiffened by internal spokes and a rim of inflated tubing. It is carried above the wheel tread on four light magnesium legs and mounted







FRANK TINSLEY

# MECHANIX ILLUSTRATED



AUGUST

20¢

Fighting Fire  
From The Air—Page 62

AMAZING NEW USES  
OF ATOMIC POWER

SHOOT AND SHOW YOUR OWN  
3-DIMENSIONAL MOVIES

# Convertible Jet Helicopter



# PEACE— OR ELSE!

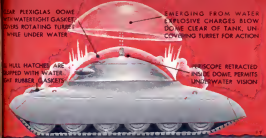


Radar and telephone control room  
shown. Directed by Robert Gould of  
the world defense New York. Radar  
interceptors would be continuous.

BY WILLIAM LEE

**H**UMANITY is faced with the greatest decision it has ever had to make. The atomic bomb, in four gigantic flashes, has transformed our planet into a world which has only one choice left. Earth has become a world of fire and ice.

Rather than be finally determined that there shall be no war, and spend as much energy, thought and money on the problem of preventing it as we now spend in preparing for it. In that case—and if we



At far left is the Alligator, a lightly armored, open cockpit craft extremely vulnerable to shore fire. In the center is the Water Buffalo, a floating tank lightly armed with a small cannon and several machine guns. At left is the proposed model blowing its plastic bubble top.

but would prove too unwieldy for subsequent land operations. Land tanks might be floated ashore on detachable, self-propelled pontoons. Like other surface craft, however, they are subject to heavy defense fire during the process. And if one of the pontoons were hit and opened, its tank would head for the bottom like a huge, steel sinker.

"Well, then," you ask, "wot-in-ell can we do? Put tracks on submarines and roll them up the beach?"

You may be closer to the answer than you think. If an adequately armored tank is too heavy to float, why not let it sink to the bottom and roll up to the beach under water? It needs only suitable sealing, a temporary air supply and a means of guiding it along passable, ocean-bed trails.

Let's take a look at the technical problems involved.

The Alligator and Water Buffalo, plus several pre-war amphibious tank designs, have proved that watertight, armored hulls can be successfully combined with practical track gear. So far as underwater sealing, air supply and sea-floor operation are concerned, a working prototype already exists. See the undersea explorer's submarine in the June '50 issue of *MI*. It is true that this machine is designed like a baby submarine with track gear. It has none of the armament, free-swinging turrets, etc., that a

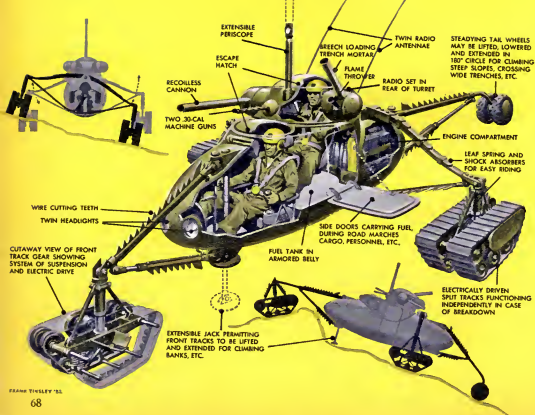
fighting tank requires. But those are problems that can be licked, too—if we really set our minds to it.

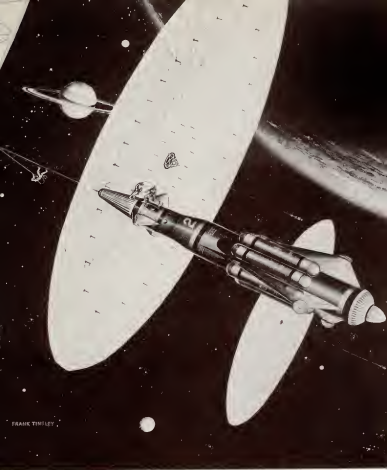
The hull, with its escape hatches, air inlet and exhaust ports, presents no great difficulties. All have been long since solved in standard submarine practice. The main problem lies in the turret. Here we are faced with an entirely separate unit, mounting a heavy, long-barreled gun. It must be capable of 360° rotation and its gun must have a 90° elevation. Mounted on a motor-driven, ball-bearing traversing ring, it is difficult to render waterproof, especially since the gun and turret must be free to swing into action as soon as the tank emerges from the water. And whatever freeing is necessary should be done from inside the tank.

If we can't waterproof the turret itself, why not cover the whole thing with something that can be waterproofed? Let's take our cue from aircraft design. The modern jet fighter faces a similar problem in a different medium. The pilot's cockpit is like a fish bowl in reverse. Surrounded by the thin, icy air of extreme altitudes, it must be kept filled with heavy, breathable air, warmed to the proper temperature and enriched with oxygen. This means that the cockpit enclosure must be airtight, strong enough to resist wide differentials in pressure and transparent enough for good visibility. Also [Continued on page 190]



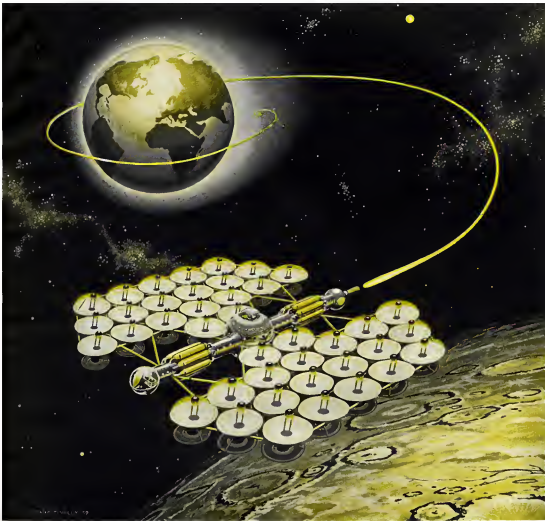






FRANK TIMLEY

Passing one of Saturn's moons, the spacecraft's crew detaches their ferry-rocket from its mile-across solar-radiation propelled sail.



STEPS IN THE RACE TO OUTER SPACE

## Cosmic Butterfly

Spreading its wings to absorb the eternal flow of solar energy is the Cosmic Butterfly, a space vehicle of a type first conceived by Dr. Ernst Stuhlinger of Redstone Arsenal.

Each of the fifty-foot parabolic mirrors in the wings concentrates the Sun's rays on a boiler at its focal point. Steam is developed, which drives a 200 kw turbogenerator in the base. Cooled by frigid outer space in heat diffusers, the steam reverts to water and is pumped back to the boiler to be used over and over again.

The current thus generated drives the main propulsion unit, an ion rocket in which powerful electric fields accelerate charged particles, shooting them from the rear of the rocket exactly as the electron gun in your TV set bombards the

screen. Sunlight, then, is the power source, whereas cesium is the propellant material.

While the recoil thrust is relatively small, the weightless vehicle is operating in a vacuum and the push is enough to enable the Butterfly to reach interplanetary speeds. Unlike conventional rockets, the Butterfly is under power the entire trip. Half way to its destination it turns around, and the ion thrust is used to slow the craft down to arrival speeds.

Since its thrust is entirely inadequate to cope with the gravity of major planets, the Cosmic Butterfly never lands. It is assembled in space

and shuttles between artificial satellites.

The Cosmic Butterfly could carry ten passengers and 50 tons of cargo from an Earth satellite to a comparable one orbiting around Mars in about one year of continuous travel.

Inertial navigation systems will play an increasing role in the exploration of outer space. ARMA, now providing such systems for the Air Force ATLAS ICBM, will be in the vanguard of the race to outer space. ARMA . . . Garden City, New York. A Division of American Bosch Arme Corporation.

**AMERICAN BOSCH ARMA CORPORATION**



# TRICOPTER SKYHOOK

*It's as simple as an ox yoke and it serves a very similar purpose.*

By Frank Tinsley



**W**HEN a heavy hauling job comes up the idea has always been "Put in more horses." Now, Raymond A. Young, an ex-Navy aeronautical engineer, has made it possible to harness helicopters in teams. His harness, as uncomplicated as an ox yoke, is a tubular framework that holds the working whirlybirds far enough apart to give them rotor room.

Various adaptations of Young's basic idea may be used. The one illustrated is a tricopter harness consisting of three girders hung to a central vertical hoist

and braced in a rigid triangle by steel cables. Above the outer end of each girder is a universal coupling which attaches to the bottom of a helicopter with a quick release fastening. Each of the machines is separately flown but all follow the commands of a chief pilot, given over interphones. Young's multi-copter harness can pick up bridge sections, ferry vehicles and equipment, emplace artillery in otherwise inaccessible positions—using standard copters instead of expensive specialized equipment. \*

# SEAGOING SAUCERS

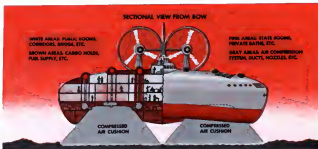


By Frank Tinsley

**T**HIS radical new ship is now under development by the British government. According to the London Daily Mail the Saunders-Roe Aircraft Co. is now hard at work on preliminary research.

The idea is essentially the same as that proposed for Ford's futuristic "Wheel-less Car." (See Oct. '58 MI) The SR design calls for an elongated saucer form with a horseshoe-shaped cavity underneath. Compressed air is expelled from nozzles in the top of this cavity, which contains the pressure and directs it against the sea's surface, lifting the saucer a few feet above the water. Airplane-type propellers, driven by gas turbines, propel the skimmer at high speed. In docking or lying at anchor, the pressure is gradually reduced and the ship lowers to the water. A water propeller and rudder are provided for surface maneuvering.

The British expect saucers to carry up to 1,000 passengers, hit over 100 mph. Development will probably take about ten years. \*







**"THIS** is WQZ, your favorite local station for music and news, bringing you a noonday program of recorded hit tunes. The first number on today's show will be . . .  
"Just one moment, please. Here's an important bulletin from our newsroom, just handed me. It's dated—*leveled* Washington, D. C.

"A terrific explosion has just wrecked downtown Washington. The blast, of unknown origin, seems to have damaged communication lines out of the city.

"I can't tell you any more because there is no more to the bulletin. So, until further news comes in we'll return to our . . .

"Wait! Here! The explosion leveled the Capitol building where Congress, the Cabinet and all high officials had gathered to hear the President deliver an important message. Everybody is believed killed. Washington is in flames!

"Another bulletin! This one's from New York. New York's financial district, nerve center of the nation's industry, was battered by a blast from a bomb apparently dropped by an unidentified plane. . . .

"My God, here's more! Four other cities—Cleveland, Detroit, Chicago and Pittsburgh—have also been attacked by what some scientists think are atom bombs!

"Yes, that's what it looks like—a sneak atom-bomb attack! I've got a thing here that says the Associated Press can't raise its Washington Bureau. Communica-

Here's an artist's impression of what would happen to our nation's Capitol under an atom-bomb attack.




super-bomber has been produced there so that might very well be the vehicle of attack. Could they reach American target cities from their trans-Polar bases undetected? That depends upon many factors. Congress has appropriated funds for the beginnings of a protective radar net. Such a net, however, is like a chain—only as strong as its weakest link. To be completely effective, it must be all-inclusive, with stations in Canada and Mexico and on ships at sea. This is a tremendously expensive setup.

To take advantage of such a warning system we would need thousands of fighter aircraft and a well-planned system of civilian defense including specially built

shelters. These facilities do not exist at present. Planes flying over Canada now would cross thousands of miles of wilderness where the few inhabitants would have little idea of whether they were Russian bombers or Hottentot airliners. And, if the planes carried standard U. S. Air Force markings indicating that they were experimental types, even the Air Force might be fooled temporarily.

Aside from the material damage, what would be the probable outcome of such an attack? Well, first of all, the nation would be paralyzed by shock for a short while. The wounds would be so great, there would be a tremendous job to do merely in overcoming the first [Continued on page 174]



## **COVER STORY**

Sectional view of the prone pilot bed superimposed on conventional jet fighter shows the radical reduction in diameter of the fuselage which would be possible. Armament is air-to-air missile launcher.

# MECHANIX ILLUSTRATED®

**15¢**

November

Jet Pilots Fly In  
Bed—Page 70

ROCHESTER, N.Y.—GOLD RUSH CITY FOR INVENTORS  
COMPLETE PLANS FOR A 35-MPH OUTBOARD RACEABOUT



# What About Those ... **SECRET WEAPONS?**

*Every war has its weird whispers about death rays, super gases and invisible submarines.*

*By Clive Howard*

**T**HE businessman got the word from the son of a scientist who heard it from a college professor working in nuclear research. Now it's traveling with a speed that would embarrass sound. From tongue to tongue, from ear to ear the whispers twist the story about America's newest secret weapon.

What is it? You mean you haven't heard? Well, at last report it was a combination Geiger-radar-rocket-fire control unit which detects atom-bomb bearing planes and directs robot missiles at them automatically!

Thus begins a new chapter in the fantastic history of the secret war weapon—a history that goes back almost to the beginning of time. Probably the original story about a secret weapon made the rounds shortly after a man discovered that a large rock could kill an enemy.

Any competent sociologist might have concluded that the atom bomb

Cosmic death rays, aimed from the tops of the tallest buildings, destroy enemy planes and even whole enemy cities many miles away.

# MECHANIX ILLUSTRATED

THE HOW-TO-DO MAGAZINE

Best Buy  
25¢  
JUNE

How We Will  
EXPLORE  
THE MOON



FRANK WILKINSON

BUILD YOUR OWN LOW-COST SWIMMING POOL



# Will Polar Waves Swamp America?

*Engineer Brown fears the vast Antarctic icecap may upset the world and drown us in a great flood at any moment!*

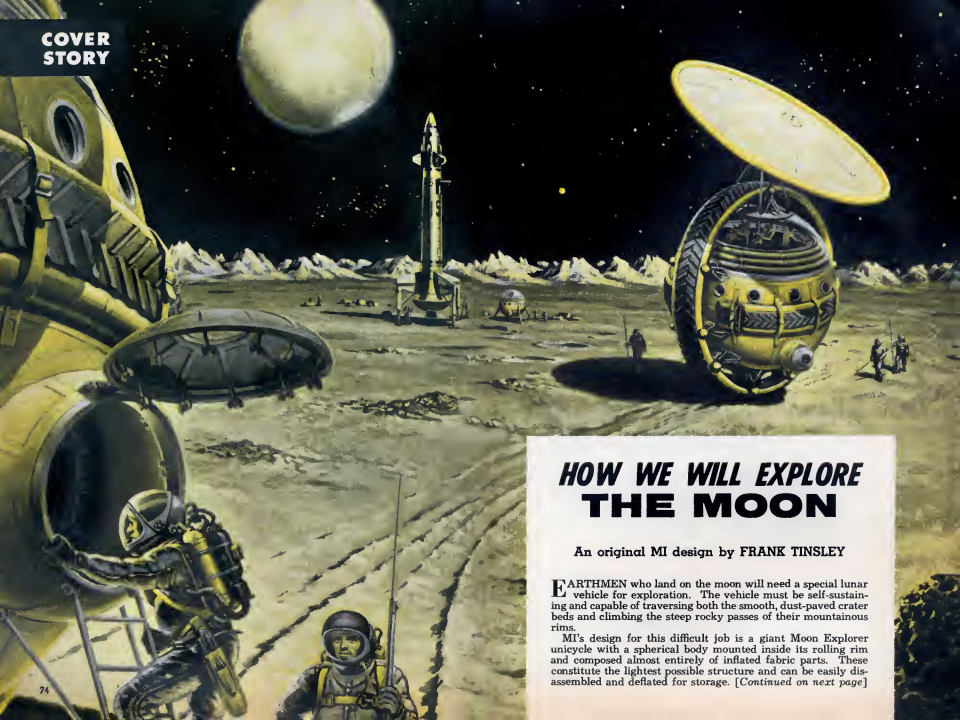
*By West Peterson*



TURN PAGE

FRANK TINSLEY





## **HOW WE WILL EXPLORE THE MOON**

**An original MI design by FRANK TINSLEY**

**E**ARTHMEN who land on the moon will need a special lunar vehicle for exploration. The vehicle must be self-sustaining and capable of traversing both the smooth, dust-paved crater beds and climbing the steep rocky passes of their mountainous rims.

MI's design for this difficult job is a giant Moon Explorer unicycle with a spherical body mounted inside its rolling rim and composed almost entirely of inflated fabric parts. These constitute the lightest possible structure and can be easily disassembled and deflated for storage. [Continued on next page]



Drawings by Martial and Scull, Industrial Designers.

# RELAX ON AIR

70

**BY JACQUES MARTIAL,**

**as told to Sophie Smollar.**

*Mechanix Illustrated*

# Why Don't We Have... **SUN POWER**

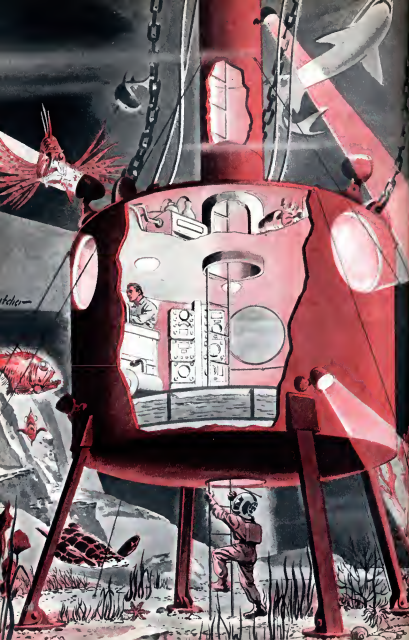
Old Sol has more energy than all the atom bombs in the world lumped together. And it's free . . . if we can find a way to harness it.

By Frank Tinsley



**E**VER since James Watt built the first steam engine, inventors have been trying to harness the sun's heat to stoke their boilers because the sun is the mightiest heat source known to man. Every hour, it floods the earth with a deluge of thermal energy equal to 21 billion tons of coal. Every day, the sun pours more potential power upon our land areas than all mankind's muscle, fuel and working waterfalls have generated since the beginning of time.

The enormous output of solar energy is almost impossible to conceive. The sun is a monster atomic-fusion furnace, some 109 times the diameter of the earth, with a central temperature of 20 million degrees centigrade. It operates like a continuous, slow-burning hydrogen bomb generating half a million billion billion horsepower



Through a small window the man at the controls sees the light from the upper world streaming down through the dark water like sunlight through the stained-glass windows of a cathedral.

A third man, on watch at another window, flashes on one of the big searchlights attached outside, scattering a crowd of curious fish that have been gazing through the window at him. Slowly the "house" comes to a stop.

"Better move us 20 yards north-northeast," says the technician in charge. "I can see the edge of the abyss." On the surface, orders are barked, the mother ship swings, and the great house inches slowly sideways, then downward, coming to rest with its pronged legs stuck in the rich mud of the deep. A scientist at the dials of the undersea laboratory reads off the pressure. A voice from above comes over the loudspeaker.

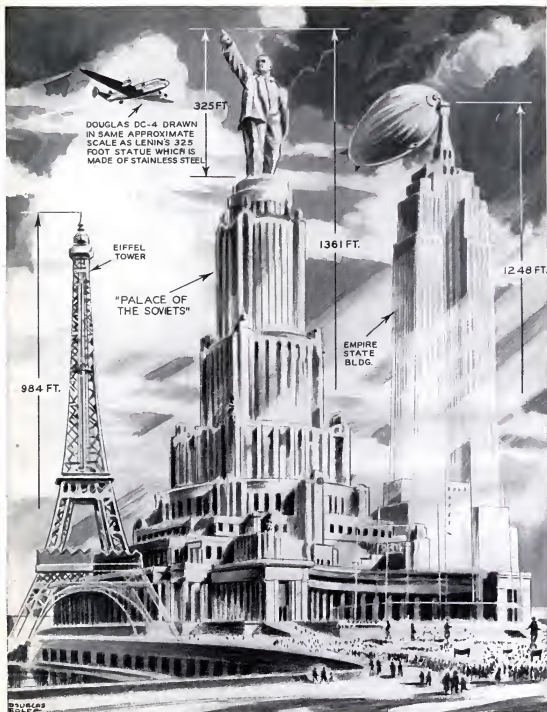
"You are resting at 154 feet," it says.

There is sudden activity inside. One of the scientists starts checking the diving equipment and apparatus stored along one side of the house. Others take down readings from the dials and make observations through the four windows. The man at the phone relays the readings to the surface where a trained crew of technicians and scientists start checking and calculating. . . .

Artificial gills! Helium breathing! Undersea laboratories! Electric lighting, telephones, radio and walkie-talkies on the ocean floor! Some of these inventions already are at hand. Others are just around the corner—not far around it. Scientists are overcoming the final obstacles to opening up a whole rich new world—the world that lies deep below the surface of the waters.



# WORLD'S TALLEST BUILDING



In this drawing, the artist has shown how the "Palace of the Soviets," now under construction in Moscow, will compare in height with the Empire State building, in New York City, at present the world's tallest structure, and with Europe's tallest, the Eiffel Tower in Paris. The Palace of the Soviets will be completed in 1942 and, including the stainless steel statue of Lenin on top, will be the world's tallest and most spacious building. The main hall will seat 25,000 and another hall will seat 6,000. The ceiling of the interior dome will be 300 feet high. The building will be serviced by 120 elevators, 60 escalators, and will contain halls, clubs, galleries, museums, and will house government archives.



# Why Don't We Have... FIRECOPTERS?



**Helicopter fire engines to fight flames from the air and rescue victims trapped on upper floors.**

**By Frank Tinsley**

**R**EMEMBER the time back in July 1945 when a fog-befuddled Army bomber crashed into the tower of New York's Empire State Building? The plane smashed through the outer wall and disintegrated, dumping a ton of high-test gasoline from its upturned tanks. This torrent sloshed through the wrecked offices and ignited with a roar. Blazing gas poured down the elevator shafts, turning them into chimneys of flame and cutting off escape from the tower floors above. Doors, windows and partitions were blown out by the blast. Plane debris, office furniture and mangled bodies were piled into the corners. Before the smoke subsided, several stories were gutted, 13 people incinerated and 25 others

Tests show that a 15,000-ton liner of Wood's design would have a speed of 32 knots, more than any other commercial vessel, at 120,000 horsepower. The Queen Mary of 80,773 tons has a speed of 32 knots with 200,000 horsepower.



FRANK TINSLEY '99

## Tunnel-Hull Boat Won't Roll

**G**AR Wood, the silver-haired king of speedboat racing, has designed the most stable boat in the world.

The no-roll Venturi is 188 feet long and 40 feet wide, and has twin hulls which slice through the waves instead of climbing over

them as do conventional craft. Propellers are 4½ feet in diameter and extend below the hull, increasing draft at the stern to about 8 feet when underway. At 26 knots the air rushing through the tunnel buoys up the ship so that she draws only 6 inches

of water at the bow. This air cushion also acts as a shock-absorber for all up-and-down movements of the boat. Wood says, "We have sailed in seas so rough that 60 of our 188 feet have been out of water between wave crests, and have made full-rudder turns at top speed with waves 10 feet high and we didn't heel over more than one or 2 degrees."

The present model was originally designed as an AAF target vessel resembling a baby flat-top. It has four pancake Diesels totaling 4,800 horsepower, is flat-bottom with a gross weight of 120 tons. Engine rooms are located ⅔ of the way aft in each hull. Hulls are planked in ¾-inch 9-ply mahogany. Forty watertight bulkheads make it unsinkable. •

Gar Wood shifts variable pitch propellers from astern to neutral to ahead by remote control.

At 26 knots waves roll their crests along her sheer sides while she rides along undisturbed.

Large masts above water is subject to wind so retractable propellers will be used for docking.

A special fishing cruiser fits fish under the tunnel and can be lowered quickly when desired.




76



77

# ROCKET CATCHER

**I**F and when space travel becomes a reality, there'll be the problem of landing high-speed rocket ships. D. B. Driskill of San Francisco thinks he has the answer in his U. S. Patent 2,592,873. He would build a system of telescoping tubes butted against a mountainside or mounted on skis or a train platform. The rocket ship would be guided into the end of the outer tube by radar. This tube would slide into the second tube, braked by air pressure, and then into the main tube. When pressure between the tubes is released, passengers would leave through doors in their walls. •



Drawing below shows rocket catcher in final position. Tubes are collapsed and rocket has "landed."





AMAZING  
MARVELS  
OF TOMORROW

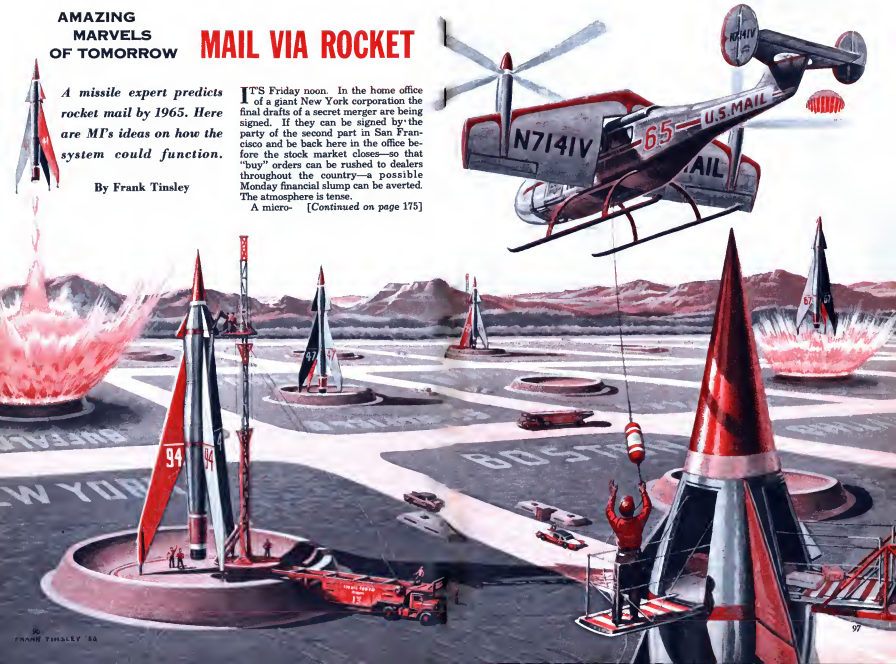
## MAIL VIA ROCKET

*A missile expert predicts rocket mail by 1965. Here are MF's ideas on how the system could function.*

By Frank Tinsley

IT'S Friday noon. In the home office of a giant New York corporation the final drafts of a secret merger are being signed. If they can be signed by the party of the second part in San Francisco and be back here in the office before the stock market closes—so that "buy" orders can be rushed to dealers throughout the country—a possible Monday financial slump can be averted. The atmosphere is tense.

A micro- [Continued on page 175]



# Helicopters for Everybody



*The Hoppicopter is evolving into a comfortable single-seat helicopter that will supply you with cheap air transportation.*

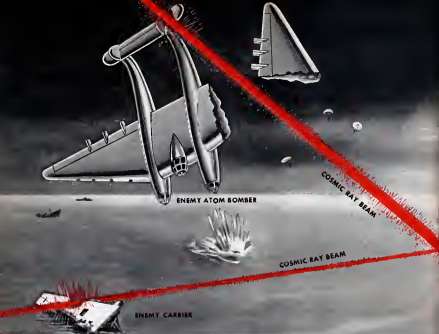
*By Frank Tinsley*

**B**ACK in the 30's, a Seattle aeronautical engineer named Horace T. Pentecost became convinced that he could design a set of personal wings. As an engineer and student of aviation history, Pentecost was well aware of the shortcomings of man-made flapping wings, so he gave the problem an entirely different solution. In place of rosy pinions, he substituted the whirling blades of the modern helicopter.

His first machine, designed for army

paratroopers, was intended to supplant the clumsy and uncontrollable parachute. Strapped to the wearer's back, it was christened "Hoppicopter" because the trooper literally hopped off and landed on his own two feet. It consisted of little more than an engine, rotors and control stick, mounted on a tubular frame that was strapped over the flier's shoulders and back.

The Hoppicopter's dependence upon human legs as landing gear proved its



BY LOIS BRITCHIN

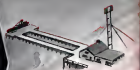
**D**ESPITE vehement reiterations that the atomic bomb is the absolute weapon, a conviction has been growing that Einstein's original equation  $E=MC^2$  has not had its final say.

The very paucity of our knowledge of the complex nuclear reactions and of the origin of matter and energy itself, would at once suggest that there may be a weapon more encompassing and deadly than the atomic bomb.

Such a weapon could well be the cosmic ray-gun.

The possibility was hinted at recently by European cosmic ray scientists. The prospect is enthralling—and frightening. The cosmic ray-gun would be the first weapon ever to use trigger energy out of this world.

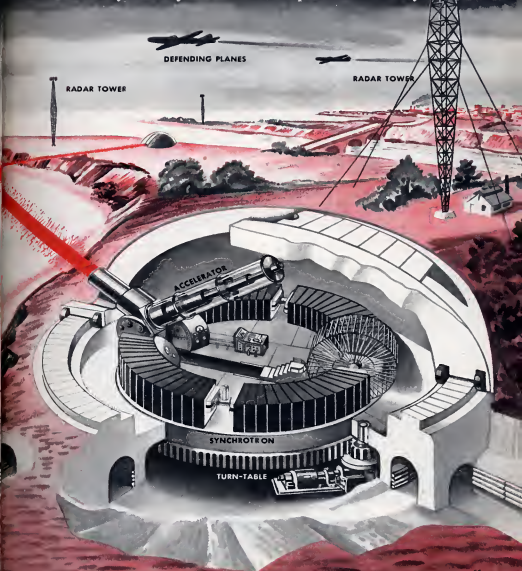
Cosmic rays have been the subject of deep research



CONTROL ROOM

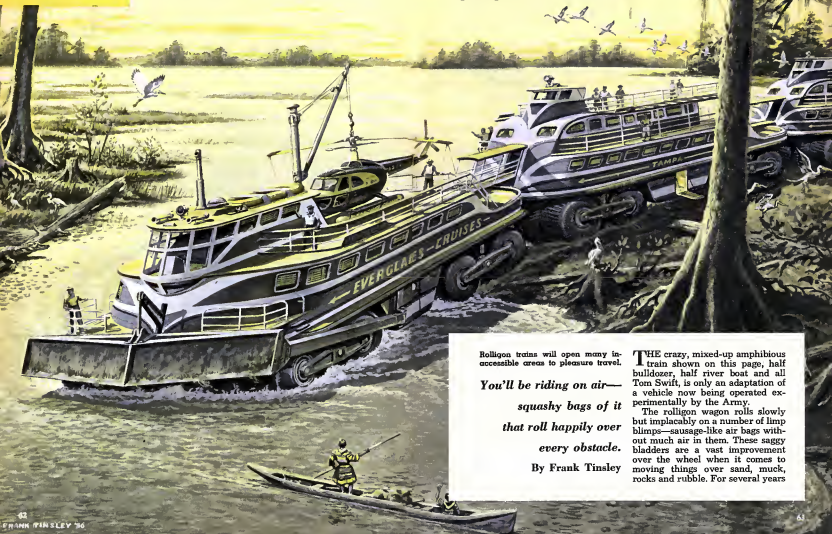
## COSMIC RAY-GUN

Atoms exploded by cosmic rays release far more radiation than is obtained by ordinary fission. Here's a potential death-ray!



# CROSS-COUNTRY

# CRUISE SHIP



Rolligon trains will open many inaccessible areas to pleasure travel.

*You'll be riding on air—  
squashy bags of it  
that roll happily over  
every obstacle.*

By Frank Tinsley

**T**HE crazy, mixed-up amphibious train shown on this page, half bulldozer, half river boat and all Tom Swift, is only an adaptation of a vehicle now being operated experimentally by the Army.

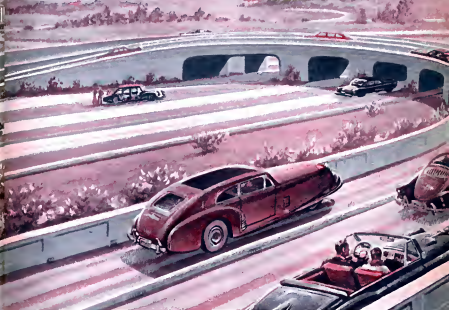
The rolligon wagon rolls slowly but implacably on a number of limp blimps—sausage-like air bags without much air in them. These saggy bladders are a vast improvement over the wheel when it comes to moving things over sand, muck, rocks and rubble. For several years



# Why Don't We Have... CRASH-PROOF HIGHWAYS

... with automatic pilots to take the wheel  
for trip-weary, accident-prone drivers.

By George W. Gibson



**I**N this age of flying saucers and 600-mph aircraft, automatic pilots are accepted as being very commonplace . . . for airplanes. But why not automatic pilots for autos?

If an inventor should offer the motorist an automatic pilot for his car, consider the tremendous safety value of such a device. The human element would be eliminated from driving. Our highways would become virtually crashproof.

Here is a system based on magnetic detection—(similar to that used to locate land mines in World War II) and radar, since it would be impractical to use radio beams as a means of directional control as with aircraft.

A ribbon of metallic material approximately 12 inches wide is located in the center of each highway lane and would have been incorporated in the highway concrete as it was poured.

The automatic pilot needs the following equipment: two magnetic detection units, a radar unit and an engine governor. This unit would work in conjunction with the car's power steering and automatic transmission. The detection units would be mounted under the nose of the vehicle, one on each side of a horizontal line running lengthwise through the body. The narrow-beam parabolic reflector of the radar antenna, en-

Why Don't We Build...

# VOICE BOMBS

Dropped from bombers over hostile territory, midget tape recorders suspended from balloons could speak messages of propaganda directly to enemy soldiers.

By Robert Hertzberg

**I**T is an hour before dawn. Exhausted from long nights and days of continual battle, enemy troops are enjoying a brief respite, sleeping fitfully in their foxholes.

Suddenly the night air is shattered by a voice thundering from above. In a few minutes hiding places are emptied as the bewildered soldiers, startled into alertness, seek to identify this strange, new apparition. They listen as the voice speaks in their native tongue.

"Oppressed citizens of the dictatorship, this is the voice of friends advising you to surrender. Unless you turn on the cruel masters who forced you into a senseless war—unless you lay down the arms you have taken up against us—we will be forced to destroy you with our superior numbers and deadly weapons. Be smart—live! You



SURRENDER  
... YOU WILL BE  
TREATED FAIRLY ...  
... FURTHER RESISTANCE  
IS HOPELESS ...

投降  
... 你们将被  
公平对待 ...  
... 进一步抵抗  
是毫无希望的 ...

# Invasion Base on the Moon

"The first nation to establish a lunar military outpost will rule the earth," says Willy Ley, expert in rocket research.

INVASION ROCKETS



The moon base could be built in a large crater, a mile or so wide, consisting concentric rings of launching platforms. A spoke-like network of roads would join these to the main central dome in the center. An alternate control post, at left, could be hidden in the crater's rim. Rockets shown are similar to Nazi A 9.

MAIN CONTROL STATION

ABLOCK

AUX. CONTROL STATION

**THE** man in the moon may plot the attack that will open World War III. For the man in the moon will be a powerful "spy in the sky" rocketed to the earth's satellite by the aggressor nation to prepare the way for an all-out assault to conquer the world.

Soon after a 20th-century Columbus pilots his rocket to the moon, the nation that sent him there will have a lunar base that will expose any spot on earth to celestial spying and sudden rocket invasion.

A well-known aircraft company, which desires to remain anonymous, is working on this man-carrying rocket depicted by an MI artist. Wings control it in air.





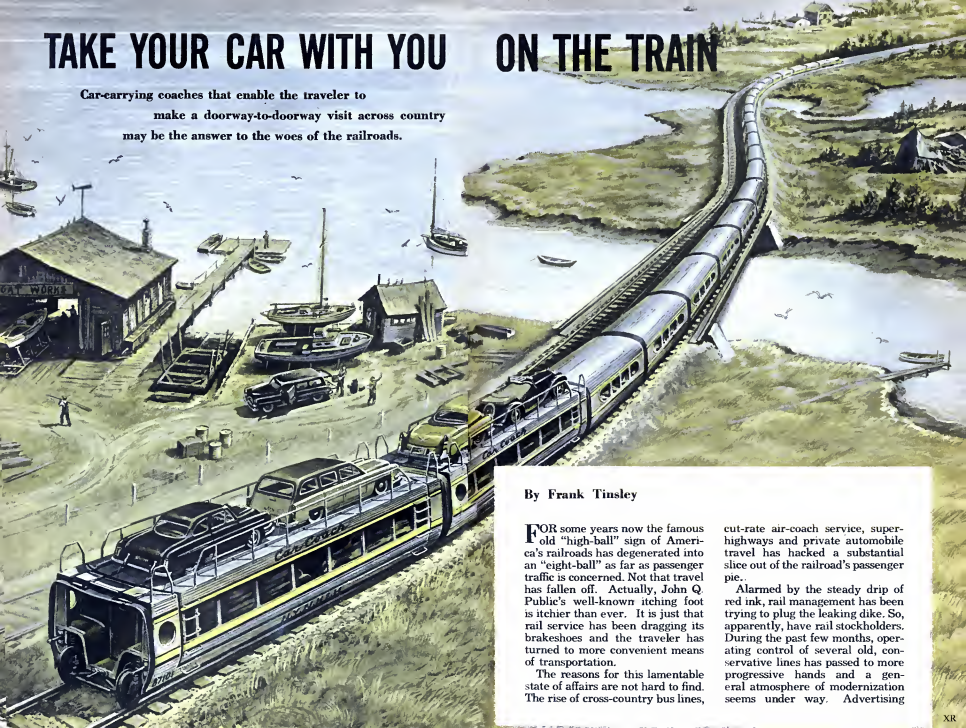
# CALIFORNIA'S BIG SQUIRT



**T**HE parched deserts of Southern California need water to transform their barren soil into fertile farmlands and tourist Meccas such as those existing elsewhere in the state. So far the problem has remained unsolved. But Sidney Cornell, a Los Angeles construction engineer, thinks he has a solution. He wants to construct a series of geyser-like power plants one mile apart to shoot water from the mouth of one into the funnel of the next, as depicted here by MI artist Frank Tinsley. The water would arc over hilly sections, have a flat trajectory over plains. Its velocity would approach 400 mph. These stations—400 in all—would cost about \$300,000 each. •

# TAKE YOUR CAR WITH YOU ON THE TRAIN

Car-carrying coaches that enable the traveler to make a doorway-to-doorway visit across country may be the answer to the woes of the railroads.



By Frank Tinsley

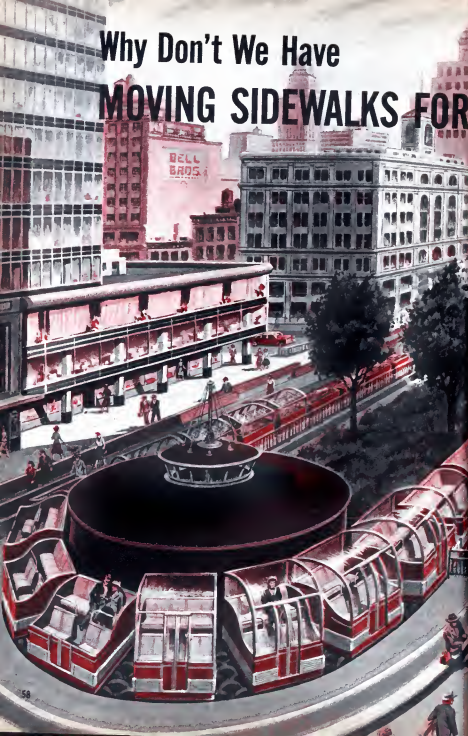
FOR some years now the famous old "high-ball" sign of America's railroads has degenerated into an "eight-ball" as far as passenger traffic is concerned. Not that travel has fallen off. Actually, John Q. Public's well-known itching foot is itchier than ever. It is just that rail service has been dragging its brakeshoes and the traveler has turned to more convenient means of transportation.

The reasons for this lamentable state of affairs are not hard to find. The rise of cross-country bus lines,

cut-rate air-coach service, super-highways and private automobile travel has hacked a substantial slice out of the railroad's passenger pie.

Alarmed by the steady drip of red ink, rail management has been trying to plug the leaking dike. So, apparently, have rail stockholders. During the past few months, operating control of several old, conservative lines has passed to more progressive hands and a general atmosphere of modernization seems under way. Advertising

# Why Don't We Have MOVING SIDEWALKS FOR CITY SHOPPING



Conveyor-belt transportation would beautify  
our streets, reduce noise and help shoppers.

By Frank Tinsley

**I**MAGINE New York's famous Fifth Avenue devoid of all wheeled traffic. No taxis, busses or private automobiles, alternately jamming up at street corners and darting ahead at the change of lights. No grinding gears, roaring motors or noxious exhaust fumes. No swarms of nervous pedestrians scurrying back and forth at dangerous intersections. Imagine, instead, a leafy mall extending down the avenue's center, green with trees and bushes, brightened with flowers and flanked by a continuous stream of comfortable public cars, flowing smoothly along on silent, rubber belts. In them, milady sits and window-shops at a leisurely pace, hopping on and off at any point she desires. Imagine, too, a pair of subsidiary moving sidewalks with safe, convenient entrances and exits, upon which the pedestrian may ride along at a normal walking pace or gain easy access to the faster-moving cars.

Does all this sound like a hashish smoker's dream of a shopper's paradise? Not to the hard-boiled engineers of Goodyear's Conveyor-Belt Division with their long and impressive record of mass movement by

FRANK TINSLEY '59

XR

# Jet Sub Fires Underwater Rockets



*Submarines can win a war, top military men say! So here's the dope on our race for undersea supremacy.*

*By Frank Tinsley*

**T**HE lowly pig-boat of yesterday has become the capital ship of tomorrow! An American jet submarine, firing underwater rockets, might tilt the balance between victory and defeat in the event of a third world war.

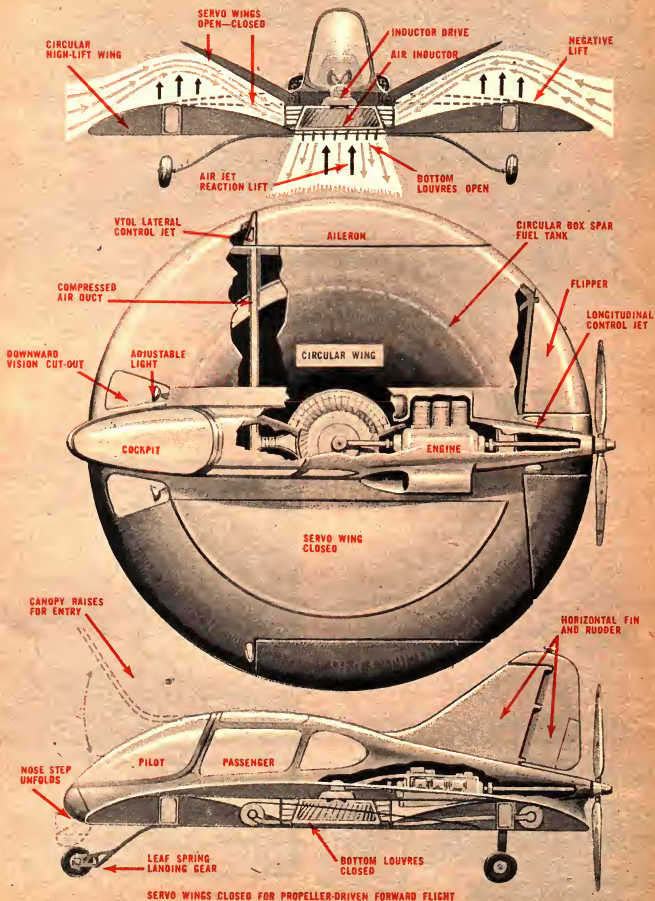
In the closing days of World War II, Germany's designers brought the U-boat to an unparalleled level of efficiency. Harried by the success of allied aircraft and radar, they came up with a series of radically new developments that threatened to wipe out our sea-borne supply lines. Looted from captured Dutch pigboat bases, the "snorkel" air breathing apparatus permitted swastika killers to cruise underwater and fight undetected without having to come up for air.

The powerful Walther hydrogen-peroxide gas turbine went a step farther, promising phenomenal underwater speeds with no air intake

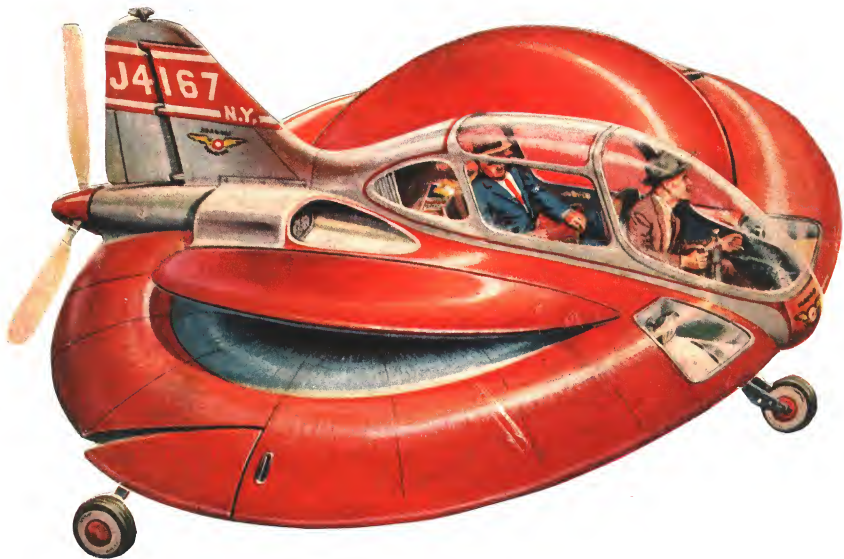
FRANK TINSLEY '49



# AIRFLOW PATTERN FOR VERTICAL TAKE-OFF AND LANDING



SERVO WINGS CLOSED FOR PROPELLER-DRIVEN FORWARD FLIGHT





# How Scientists Visualize The REAL Flying Saucer Men

*When scholars of the universe recreate spacemen along logical scientific lines, even those supposed weird little saucerites seem ordinary by comparison.*

*By I. B. Neer*

**P**RYING eyes of science are probing into space again in the hope of detecting life on other planets.

Armed with new facts, previously accepted theories about what lies beyond the Earth are being discarded by scientists every day and the possibility grows more and more distinct that creatures, more fantastic than our most vivid imaginations could conjure up, may inhabit the planets around us. They